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EXAMINER	
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ART UNIT	**PAPER NUMBER**
1753	8

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Please find below and/or attached an Office communication concerning this application or proceeding.

cb8

Office Action Summary	Application No.	Applicant(s)	
	09/868,577	KAWASAKI, KIYOHIRO	
	Examiner	Art Unit	
	Brian L. Mutschler	1753	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 August 2003* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *3-24* is/are pending in the application.

4a) Of the above claim(s) *13-20,23 and 24* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *3-12,21 and 22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *20 June 2001* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *4* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

Election/Restrictions

1. Claims 13-20, 23 and 24 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected invention, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in Paper No. 7.

2. Applicant's election with traverse of Group I, claims 3-12, 21 and 22, in Paper No. 7 is acknowledged. The traversal is on the ground(s) that a search would not pose a serious burden. This is not found persuasive because the claims of Group I are classified in a different class than the claims of Group II.

The requirement is still deemed proper and is therefore made FINAL.

Drawings

3. The drawings are objected to because in Figure 17, it appears that "Ozon" should be "Ozone." A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

4. Figures 3, 4, 5, and 10 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

5. The abstract of the disclosure is objected to because it contains multiple paragraphs. Correction is required. See MPEP § 608.01(b).

6. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

7. The disclosure is objected to because of the following informalities:

a. On page 53 at line 1, please change "FIGUER" to --FIGURE--.

Appropriate correction is required.

8. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Rejections - 35 USC § 112

9. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

10. Claims 4-10, 12, 21 and 22 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 4 recites the limitations " in accordance with a specified rule" in lines 5-6 and 7-8. These limitations are indefinite because the specified rule is not clearly defined. Any rule can be used to define the size and shape of the electrode plate. The same limitations also occur in claim 5 (lines 5 and 7-8); claim 6 (lines 4-5 and 6-7); and claim 7 (lines 7-8 and 9-10). The same applies to dependent claims 8-10 and 21.

Claim 6 recites the limitations "a frame-like container type" in lines 8-9 (first of several occurrences) and "frame-like container" in line 12 (first of several occurrences). The addition of terms "like" or "type" to otherwise definite phrases renders the claim indefinite because it is not clear what properties are encompassed by "like" or "type." The same applies to dependent claims 8 and 10, which also recite similar limitations. Similar limitations also appear in claim 12.

Claim 7 recites the limitations "box-like container type" in lines 3-4 (first of several occurrences) and "box-like container" in lines 5-6 (first of several occurrences). The addition of terms "like" or "type" to otherwise definite phrases renders the claim indefinite because it is not clear what properties are encompassed by "like" or "type." The same applies to dependent claim 21, which also recites similar limitations. Similar limitations also appear in claims 12 and 22.

Claim 8 recites the limitation "a treatment such as inspection" in lines 4-5. The phrase "such as" renders the claim indefinite because it is unclear whether the limitations following the phrase are part of the claimed invention. See MPEP § 2173.05(d).

Claim 10 recites the limitation "the box-like container type chemical solution confining means" in lines 6-7. In addition to the use of the terms "like" and "type" as addressed above, the claim is indefinite because the phrase lacks antecedent basis. Claim 6, from which claim 10 depends, does not recite a box container.

Claim Rejections - 35 USC § 102

11. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

12. Claims 3, 4, 6, 7, 8 and 21 are rejected under 35 U.S.C. 102(e) as being anticipated by Ting et al. (U.S. Pat. No. 6,017,437).

Regarding claim 3, Ting et al. disclose the following limitations:

An in-substrate selective electric chemical treatment system comprising:

holding means (**13**) for holding an insulating substrate (**35**) (fig. 5; col. 5, lines 14-23);

an electrode (**15**) connected, in the periphery of the insulating substrate (**35**), to a conductive pattern formed on the insulating substrate held by the holding means (**13**) (figs. 5 and 9; col. 7, line 57 to col. 8, line 15);

chemical solution confining means (**12**) for confining a chemical solution in only a specified region on the insulating substrate (**35**), the specified region being smaller than the insulating substrate or slightly larger than an image displaying section on an active substrate formed on the insulating substrate (fig. 5);

a reversed polarity electrode plate (**14**) for applying an electric charge to the chemical solution, the electric charge having polarity opposite to that of the conductive pattern (fig. 5); and

chemical solution supplying (**36**) and discharging (**30, 23**) means for supplying and discharging the chemical solution to and from the insulating substrate (**35**) (fig. 5; col. 4, lines 53-61; and col. 6, line 62-64).

Regarding claim 4, Ting et al. teach the use of an electrode **14**, which is smaller than the substrate **35** and confines the chemical solution to the space between the electrode **14** and the substrate **35** (fig. 5).

Regarding claim 6, the electrode **14** is smaller than the substrate **35** (fig. 5). The chemical confining means **12** is a frame-shaped container with a flexible sealing member **42** located at the lower end (figs. 5 and 9; col. 8, lines 38-42). The system comprises means **17** (shaft) to press the container **12** and substrate **35** together (figs. 5 and 6; col. 6, lines 5-19).

Regarding claim 7, the electrode **14** is smaller than the substrate **35** (fig. 5). The chemical confining means **12** is a box-shaped container with a flexible sealing member **42** located at the lower end (figs. 5 and 9; col. 8, lines 38-42). The system comprises means **17** (shaft) to press the container **12** and substrate **35** together (figs. 5 and 6; col. 6, lines 5-19).

Regarding claim 8, Ting et al. disclose washing means **18** to spray a washing solution (deionized water) (fig. 5; col. 9, lines 5-43).

Regarding claim 21, Ting et al. disclose fluid supply and discharge means (**18, 19, 20, 30, 36**) for supplying and discharging at least one of a chemical solution, washing liquid and drying gas to and from the box-shaped contained (fig. 5; col. 4, lines 53-61; col. 6, line 62-64; and col. 9, lines 5-43).

Since Ting et al. teach all of the limitations recited in the instant claims, the reference is deemed to be anticipatory.

13. Claims 3-7 and 21 are rejected under 35 U.S.C. 102(e) as being anticipated by Talieh (U.S. Pat. No. 6,176,992).

Regarding claim 3, Talieh discloses the following:

An in-substrate selective electric chemical treatment system comprising:

holding means (**16**) for holding an insulating substrate (**Wafer**) (fig. 1B; col. 5, lines 38-41);

an electrode (**28**) connected; in the periphery of the insulating substrate (**Wafer**), to a conductive pattern formed on the insulating substrate (fig. 2);

chemical solution confining means for confining a chemical solution in only a specified region on the insulating substrate, the specified region being smaller than the insulating substrate or slightly larger than an image displaying section on an active substrate formed on the insulating substrate (fig. 2);

a reversed polarity electrode plate (**30**) for applying an electric charge to the chemical solution, the electric charge having polarity opposite to that of the conductive pattern (fig. 2); and

chemical solution supplying (**34**) and discharging (**40**) means for supplying and discharging the chemical solution to and from the insulating substrate (**Wafer**) (fig. 2).

Regarding claim 4, the electrode plate **30** has a size and shape smaller than the substrate (fig. 2). The electrode plate **30** also serves to confine the chemical solution between the electrode and the substrate (fig. 2).

Regarding claim 5, the electrode plate **30** has a size and shape smaller than the substrate (fig. 2). The electrode plate **30** also comprises a pad **32** that serves to confine the chemical solution between the electrode and the substrate (fig. 2).

Regarding claim 6, the confining means is frame-shaped, wherein a seal **26** is positioned at the lower end of the frame-shaped portion (fig. 2). The system further comprises pressing means to press the container against the substrate (col. 4, lines 3-23).

Regarding claim 7, the confining means is box-shaped, wherein a seal **26** is positioned at the lower end of the frame-shaped portion (fig. 2). The system further

comprises pressing means to press the container against the substrate (col. 4, lines 3-23).

Regarding claim 21, the system comprises fluid supply (**34**) and discharge (**40**) means for supplying and discharging at least one of a chemical solution, washing liquid and drying gas to and from the container (fig. 2; col. 5, lines 49-52).

Since Talieh teaches all of the limitations recited in the instant claims, the reference is deemed to be anticipatory.

14. Claims 3, 7 and 21 are rejected under 35 U.S.C. 102(e) as being anticipated by Batz, Jr., et al. (U.S. Pat. No. 6,334,937).

Regarding claim 3, Batz, Jr., et al. disclose the following:

An in-substrate selective electric chemical treatment system comprising:

holding means (**30**) for holding an insulating substrate (**25**) (fig. 1; col. 4, lines 28-37);

an electrode (**150**) connected, in the periphery of the insulating substrate (**25**), to a conductive pattern formed on the insulating substrate (fig. 6);

chemical solution confining means (**35**) for confining a chemical solution in only a specified region on the insulating substrate (**25**), the specified region being smaller than the insulating substrate or slightly larger than an image displaying section on an active substrate formed on the insulating substrate (fig. 1);

a reversed polarity electrode plate (**55**) for applying an electric charge to the chemical solution, the electric charge having polarity opposite to that of the conductive pattern (fig. 1); and

chemical solution supplying (**50**) and discharging (**40**) means for supplying and discharging the chemical solution to and from the insulating substrate (**25**) (fig. 1).

Regarding claim 7, the confining means **35** comprise a box-shaped container that has a flexible seal **200** (fig. 6; col. 10, lines 41-50). The system further comprises pressing means that press the wafer and confining means together (col. 10, lines 41-50).

Regarding claim 21, the system comprises fluid supply **50** and discharge **40** means for supplying and discharging at least one of a chemical solution, washing liquid and drying gas to and from the container (fig. 1l col. 4, lines 38-65).

Since Batz, Jr., et al. teach all of the limitations recited in the instant claims, the reference is deemed to be anticipatory.

Claim Rejections - 35 USC § 103

15. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

16. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ting et al. (U.S. Pat. No. 6,017,437) in view of Icxi et al. (U.S. Pat. No. 3,637,468).

Ting et al. teach the limitations recited in claims 3, 4, 6-8, and 21 of the instant invention, as explained above in section 12.

The system of Ting et al. differs from the instant invention because Ting et al. do not disclose electrode plate temperature controlling means for controlling the temperature of the electrode plate by flowing temperature-controlling liquid within the electrode plate, as recited in claim 9.

The operation of electrolytic cells generates Joule heating due to the passage of current through the electrodes and the solution and the resistance associated with each element. Electrolytic reactions are temperature dependant. Icxi et al. teach that cooling is often required in electrolytic systems (col. 2, lines 1-5). Icxi et al. further teach the use of electrodes cooled by flowing cooling fluid through the electrode (col. 2, lines 5-10).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the system of Ting et al. to use an electrode temperature controlling means as taught by Icxi et al. because electrode cooling means allow the electrodes to be cooled, thus countering the Joule heating effect.

17. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Talieh (U.S. Pat. No. 6,176,992) in view of Icxi et al. (U.S. Pat. No. 3,637,468).

Talieh teaches the limitations recited in claims 3-7 and 21 of the instant invention, as explained above in section 13.

The system of Talieh differs from the instant invention because Talieh does not disclose electrode plate temperature controlling means for controlling the temperature of

the electrode plate by flowing temperature-controlling liquid within the electrode plate, as recited in claim 9.

The operation of electrolytic cells generates Joule heating due to the passage of current through the electrodes and the solution and the resistance associated with each element. Electrolytic reactions are temperature dependant. Icxi et al. teach that cooling is often required in electrolytic systems (col. 2, lines 1-5). Icxi et al. further teach the use of electrodes cooled by flowing cooling fluid through the electrode (col. 2, lines 5-10).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the system of Talieh to use an electrode temperature controlling means as taught by Icxi et al. because electrode cooling means allow the electrodes to be cooled, thus countering the Joule heating effect.

18. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ting et al. (U.S. Pat. No. 6,017,437) in view of Batz, Jr., et al. (U.S. Pat. No. 6,334,937).

Ting et al. teach the limitations recited in claims 3, 4, 6-8, and 21 of the instant invention, as explained above in section 12. Ting et al. further disclose that "new fluid is continually introduced into the primary containment region **28**" and overflow is removed through outlet **30** (col. 11, lines 45-48).

The system of Ting et al. differs from the instant invention because Ting et al. do not disclose chemical solution temperature controlling means for controlling the temperature of the chemical solution.

As explained above, electrical processes generate heat through the Joule effect. Batz, Jr., et al. teach that an optimum temperature exists for electrochemical processes and disclose the use of a chemical solution temperature controlling means for maintaining the temperature of the chemical solution within a desired range (col. 4, lines 51-62).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the system of Ting et al. to use a temperature controller to control the temperature of the chemical solution as taught by Batz, Jr., et al. because controlling the temperature maintains the chemical solution at the optimum temperature for the electrochemical process.

19. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Talieh (U.S. Pat. No. 6,176,992)in view of Batz, Jr., et al. (U.S. Pat. No. 6,334,937).

Talieh teaches the limitations recited in claims 3-7 and 21 of the instant invention, as explained above in section 13.

Ting et al. teach the limitations recited in claims 3, 4, 6-8, and 21 of the instant invention, as explained above in section 12. Ting et al. further disclose that the chemical solution is recycled (col. 4, lines 52-57).

The system of Talieh differs from the instant invention because Talieh does not disclose chemical solution temperature controlling means for controlling the temperature of the chemical solution.

As explained above, electrical processes generate heat through the Joule effect. Batz, Jr., et al. teach that an optimum temperature exists for electrochemical processes and disclose the use of a chemical solution temperature controlling means for maintaining the temperature of the chemical solution within a desired range (col. 4, lines 51-62).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the system of Talieh to use a temperature controller to control the temperature of the chemical solution as taught by Batz, Jr., et al. because controlling the temperature maintains the chemical solution at the optimum temperature for the electrochemical process.

20. Claims 11, 12 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ting et al. (U.S. Pat. No. 6,017,437).

Regarding claim 11, Ting et al. disclose the following:

An electric chemical treatment process for treating a substrate by use of an in-substrate selective electric chemical treatment system which comprises (a) holding means (**13**) for holding an insulating substrate (**35**) (fig. 5); (b) an electrode (**15**) connected, in the periphery of the insulating substrate (**35**), to a conductive pattern formed on the insulating substrate held by the holding means (figs. 5 and 9; col. 3, lines 48-61); (c) chemical solution confining means (**12**) for confining a chemical solution in only a specified region, the specified region being smaller than the insulating substrate or slightly larger than an image displaying section on an active substrate formed on the

insulating substrate (fig. 5); (d) a reversed polarity electrode plate (**14**) for applying an electric charge to the chemical solution, the electric charge having polarity opposite to that of the conductive pattern (fig. 5); and (e) chemical solution supplying (**36**) and discharging (**30**) means for supplying and discharging the chemical solution to and from the insulating substrate (**35**) (fig. 5), the treatment process comprising:

a holding step of holding the insulating substrate having the conductive pattern on the holding means (col. 4, lines 19-44);

a chemical solution confining step of supplying a predetermined amount of the specified chemical solution to the specified region on the insulating substrate and confining it in the specified region (col. 4, lines 45-61);

a contacting step of making the reversed polarity electrode plate close to the insulating substrate such that the reversed polarity electrode plate comes in contact with the chemical solution on the upper surface of the insulating substrate (fig. 5; col. 6, line 36 to col. 7, line 54);

a polarity connecting step of bringing the electrode into contact with the conductive pattern in the periphery of the insulating substrate (fig. 9; col. 7, line 55 to col. 9, line 43); and

a treatment step of carrying out a specified treatment by applying a current between the electrode and the reversed polarity electrode plate (col. 10, line 37 to col. 12, line 22).

Regarding claim 12, Ting et al. disclose the following:

An electric chemical treatment process for treating a substrate by use of an in-substrate selective electric chemical treatment system which comprises (a) holding means (**13**) for holding an insulating substrate (**35**) (fig. 5); (b) an electrode (**15**) connected, in the periphery of the insulating substrate (**35**), to a conductive pattern formed on the insulating substrate held by the holding means (**13**) (figs. 5 and 9; col. 3, lines 48-61); (c) a reversed polarity electrode plate (**14**) having a specified size and shape smaller than the insulating substrate (**35**) in accordance with a specified rule or slightly larger than an image displaying section of an active substrate formed on the insulating substrate in accordance with a specified rule (fig. 5); (d) container type chemical solution confining means (**12**) which is a frame-like or box-like container having, at its lower end or its upper and lower ends, an opening slightly larger than the reversed polarity electrode plate (**14**) and having a flexible sealing material (**42**) attached to an area around the opening at the lower end (figs. 5 and 9); and (e) pressing means for pressing the container type chemical solution confining means (**12**) against the insulating substrate (**35**), with the reversed polarity electrode plate (**14**) being stored in the container type chemical solution confining means (fig. 5);

the treatment process comprising:

a holding step of holding the insulating substrate having the conductive pattern on the holding means (col. 4, lines 19-44);

a chemical solution supplying step of supplying a specified chemical solution to a space defined by the container type chemical solution confining means and the insulating substrate (col. 4, lines 45-61);

an electrode connecting step of connecting the electrode to the conductive pattern in the periphery of the insulating substrate (fig. 9; col. 7, line 55 to col. 9, 43); and

a substrate treatment step of applying current between the electrode and the reversed polarity electrode plate to apply a specified treatment to the insulating substrate (col. 10, line 37 to col. 12, line 22).

Regarding claim 22, Ting et al. teach the following:

A chemical treatment process for a substrate by use of an in-substrate selective chemical treatment system having (a) a stage (**13**) for holding an insulating substrate (**35**) (fig. 5), (b) a box-like container (**12**) in which a flexible sealing material (**42**) is embedded around an open end in a region, which is smaller than the insulating substrate (**35**) or slightly larger than an active substrate formed on the insulating substrate, the open end being smaller than said region (figs. 5 and 9), (c) a mechanism (**17**) for pressing the box-like container (**12**) against the insulating substrate (**35**) (figs. 5 and 6), and (d) a mechanism (**18-20, 30, 36**) for supplying and discharging a chemical solution, pure water or drying gas to and from the pressed box-like container (fig. 5; col. 9, lines 5-43),

the process comprising:

a holding step of holding the insulating substrate on the stage (col. 4, lines 19-44);

a pressing step of pressing the box-like container against the insulating substrate (col. 6, lines 5-35);

a specified treatment step of applying a specified chemical treatment to the insulating substrate by supplying the chemical solution to the box-like container (col. 4, lines 45-61);

a washing step of washing the inside of the box-like container and the insulating substrate by supplying a washing fluid to them after discharge of the chemical solution col. 9, lines 5-43; col. 11, line 25 to col. 12, line 6); and

a drying step of drying the inside of the box-like container and the insulating substrate by supplying drying gas to them after discharge of the washing fluid (col. 9, lines 5-43).

The method of Ting et al. differs from the instant invention because Ting et al. do not expressly disclose the use of direct current during the processing step, as recited in claims 11, 12 and 22.

Although Ting et al. do not expressly disclose the use of direct current, one skilled in the art would recognize that the use of direct current is implied by the use of the terms "anode" and "cathode" taken in combination with the disclosed processes performed in the method (electroplating and electropolishing). Additionally, alternating current would not achieve the desired results of Ting et al. because alternating current would etch any material plated in the previous cycle. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have used direct current in the method of Ting et al. because it would achieve the desired results. (It is further noted that Ting et al. disclose that the polarity of the

potential applied to the electrodes can be switched to change the anode to a cathode and the cathode to an anode (col. 12, lines 15-22).

21. Claims 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Talieh (U.S. Pat. No. 6,176,992).

Regarding claim 11, Talieh discloses the following:

An electric chemical treatment process for treating a substrate by use of an in-substrate selective electric chemical treatment system which comprises (a) holding means (**16**) for holding an insulating substrate (**Wafer**) (figs. 1B and 2); (b) an electrode (**28**) connected, in the periphery of the insulating substrate (**Wafer**), to a conductive pattern formed on the insulating substrate held by the holding means (fig. 2); (c) chemical solution confining means for confining a chemical solution in only a specified region, the specified region being smaller than the insulating substrate or slightly larger than an image displaying section on an active substrate formed on the insulating substrate (fig. 2); (d) a reversed polarity electrode plate (**30**) for applying an electric charge to the chemical solution, the electric charge having polarity opposite to that of the conductive pattern (fig. 2); and (e) chemical solution supplying (**34**) and discharging (**40**) means for supplying and discharging the chemical solution to and from the insulating substrate (**Wafer**) (fig. 2), the treatment process comprising:

a holding step of holding the insulating substrate having the conductive pattern on the holding means (col. 4, lines 3-24);

a chemical solution confining step of supplying a predetermined amount of the specified chemical solution to the specified region on the insulating substrate and confining it in the specified region (col. 4, lines 24-57);

a contacting step of making the reversed polarity electrode plate close to the insulating substrate such that the reversed polarity electrode plate comes in contact with the chemical solution on the upper surface of the insulating substrate (fig. 2; col. 4, line 61 to col. 5, line 60);

a polarity connecting step of bringing the electrode into contact with the conductive pattern in the periphery of the insulating substrate (fig. 2; col. 4, line 61 to col. 5, line 60); and

a treatment step of carrying out a specified treatment by applying a current between the electrode and the reversed polarity electrode plate (col. 4, line 61 to col. 5, line 60).

Regarding claim 12, Talieh discloses the following:

An electric chemical treatment process for treating a substrate by use of an in-substrate selective electric chemical treatment system which comprises (a) holding means (**16**) for holding an insulating substrate (**Wafer**) (fig. 1B); (b) an electrode (**28**) connected, in the periphery of the insulating substrate (**Wafer**), to a conductive pattern formed on the insulating substrate held by the holding means (**16**) (fig. 2); (c) a reversed polarity electrode plate (**30**) having a specified size and shape smaller than the insulating substrate (**Wafer**) in accordance with a specified rule or slightly larger than an image displaying section of an active substrate formed on the insulating substrate in

accordance with a specified rule (fig. 2); (d) container type chemical solution confining means which is a frame-like or box-like container having, at its lower end or its upper and lower ends, an opening slightly larger than the reversed polarity electrode plate (**30**) and having a flexible sealing material (**26**) attached to an area around the opening at the lower end (fig. 2); and (e) pressing means for pressing the container type chemical solution confining means against the insulating substrate (**Wafer**), with the reversed polarity electrode plate (**30**) being stored in the container type chemical solution confining means (fig. 2);

the treatment process comprising:

a holding step of holding the insulating substrate having the conductive pattern on the holding means (col. 4, lines 3-24);

a chemical solution supplying step of supplying a specified chemical solution to a space defined by the container type chemical solution confining means and the insulating substrate (col. 4, lines 24-57);

an electrode connecting step of connecting the electrode to the conductive pattern in the periphery of the insulating substrate (fig. 2; col. 4, line 61 to col. 5, line 60); and

a substrate treatment step of applying current between the electrode and the reversed polarity electrode plate to apply a specified treatment to the insulating substrate (col. 4, line 61 to col. 5, line 60).

The method of Talieh differs from the instant invention because Talieh does not expressly disclose the use of direct current during the processing step, as recited in claims 11 and 12.

Although Talieh does not expressly disclose the use of direct current, one skilled in the art would recognize that the use of direct current is implied by the use of the terms "anode" and "cathode" taken in combination with the disclosed processes performed in the method. Additionally, alternating current would not achieve the desired results of Talieh because alternating current would etch any material plated in the previous cycle. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have used direct current in the method of Talieh because it would achieve the desired results.

22. Claims 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Batz, Jr., et al. (U.S. Pat. No. 6,334,937).

Regarding claim 11, Batz, Jr., et al. discloses the following:

An electric chemical treatment process for treating a substrate by use of an in-substrate selective electric chemical treatment system which comprises (a) holding means (**30**) for holding an insulating substrate (**25**) (fig. 1); (b) an electrode (**150**) connected, in the periphery of the insulating substrate (**25**), to a conductive pattern formed on the insulating substrate held by the holding means (fig. 6); (c) chemical solution confining means (**35**) for confining a chemical solution in only a specified region, the specified region being smaller than the insulating substrate or slightly larger than an image

displaying section on an active substrate formed on the insulating substrate (fig. 1); (d) a reversed polarity electrode plate (**55**) for applying an electric charge to the chemical solution, the electric charge having polarity opposite to that of the conductive pattern (fig. 1); and (e) chemical solution supplying (**50**) and discharging (**40**) means for supplying and discharging the chemical solution to and from the insulating substrate (**25**) (fig. 1), the treatment process comprising:

a holding step of holding the insulating substrate having the conductive pattern on the holding means (col. 16, line 55 to col. 18, line 7);

a chemical solution confining step of supplying a predetermined amount of the specified chemical solution to the specified region on the insulating substrate and confining it in the specified region (col. 7, lines 18-53);

a contacting step of making the reversed polarity electrode plate close to the insulating substrate such that the reversed polarity electrode plate comes in contact with the chemical solution on the upper surface of the insulating substrate (fig. 1; col. 7, lines 18-53);

a polarity connecting step of bringing the electrode into contact with the conductive pattern in the periphery of the insulating substrate (fig. 1; col. 7, lines 18-53); and

a treatment step of carrying out a specified treatment by applying a current between the electrode and the reversed polarity electrode plate (col. 7, lines 18-53).

Regarding claim 12, Batz, Jr., et al. discloses the following:

An electric chemical treatment process for treating a substrate by use of an in-substrate selective electric chemical treatment system which comprises (a) holding means (**30**) for holding an insulating substrate (**25**) (fig. 1); (b) an electrode (**150**) connected, in the periphery of the insulating substrate (**25**), to a conductive pattern formed on the insulating substrate held by the holding means (**30**) (fig. 6); (c) a reversed polarity electrode plate (**55**) having a specified size and shape smaller than the insulating substrate (**25**) in accordance with a specified rule or slightly larger than an image displaying section of an active substrate formed on the insulating substrate in accordance with a specified rule (fig. 1); (d) container type chemical solution confining means (**35**) which is a frame-like or box-like container having, at its lower end or its upper and lower ends, an opening slightly larger than the reversed polarity electrode plate (**55**) and having a flexible sealing material (**200**) attached to an area around the opening at the lower end (fig. 6); and (e) pressing means for pressing the container type chemical solution confining means against the insulating substrate (**25**), with the reversed polarity electrode plate (**55**) being stored in the container type chemical solution confining means (fig. 1);

the treatment process comprising:

a holding step of holding the insulating substrate having the conductive pattern on the holding means (col. 16, line 55 to col. 18, line 7);

a chemical solution supplying step of supplying a specified chemical solution to a space defined by the container type chemical solution confining means and the insulating substrate (col. 7, lines 18-53);

an electrode connecting step of connecting the electrode to the conductive pattern in the periphery of the insulating substrate (fig. 6; col. 7, lines 18-53); and

a substrate treatment step of applying current between the electrode and the reversed polarity electrode plate to apply a specified treatment to the insulating substrate (col. 7, lines 18-53).

The method of Batz, Jr., et al. differs from the instant invention because Batz, Jr., et al. do not expressly disclose the use of direct current during the processing step, as recited in claims 11 and 12.

Although Batz, Jr., et al. do not expressly disclose the use of direct current, one skilled in the art would recognize that the use of direct current is implied by the use of the terms "anode" and "cathode" taken in combination with the disclosed processes performed in the method. Additionally, alternating current would not achieve the desired results of Batz, Jr., et al. because alternating current would etch any material plated in the previous cycle. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have used direct current in the method of Batz, Jr., et al. because it would achieve the desired results.

Conclusion

23. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following references also disclose systems and processes using solution confinement means:

U.S. Pat. No. 5,284,554 Datta et al.

U.S. Pat. No. 5,776,330 D'Muhala

U.S. Pat. No. 6,103,096 Datta et al.

U.S. Pat. No. 6,328,872 Talieh et al.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian L. Mutschler whose telephone number is (703) 305-0180. The examiner can normally be reached on Monday-Friday from 7:30am to 4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on (703) 308-3322. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

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blm
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